

What is claimed is:

1. An isolated type switching power supply apparatus which comprises a power supply, a transformer being connected to said power supply, a switching means for switching an electric current going through a primary winding of said transformer with a switching frequency so that an energy generated on the primary side of said transformer is sent to the secondary side in accordance with the operation of said switching means, comprising:
 - a modulating means for modulating an output on the secondary side of said transformer with a modulating frequency which is different from said switching frequency;
 - a transmitting means for transmitting an output of said modulating means from the secondary side to the primary side of said transformer;
 - a demodulating means for demodulating the modulated output at the primary side, which has been transferred by said transferring means; and
 - a switching means controlling circuit for controlling said switching means in accordance with an output of said demodulating circuit;wherein said switching means controlling circuit is provided at the primary side of said transformer.
2. An isolated type switching power supply apparatus according to Claim 1, wherein said transformer comprises at least a primary winding, a secondary winding, a transmitting winding and a receiving winding; and wherein said transmitting winding and said receiving winding are provided in the vicinity of imaginary surfaces formed by extending of surfaces of arm/arms of cores facing to each other; and wherein said transmitting winding and said receiving winding are provided so as to face to each other and so as to be closer to said cores than said primary winding and said secondary winding, respectively.
3. An isolated type switching power supply apparatus according to Claim 1, wherein said apparatus carries out a soft switching operation.
4. An isolated type switching power supply apparatus according to Claim 1, wherein

said apparatus comprises a synchronous means using an EFT at the secondary side of the transformer.

- 5 5. An isolated type switching power supply apparatus according to Claim 1, wherein said switching means controlling circuit is so arranged as to detect a ZCD (Zero Current Detect) and then turn the switching means ON after the ZCD is detected and then a predetermined time period has passed, and wherein a capacitor and a diode are provided for an AC coupling to detect the ZCD.
6. An isolated type switching power supply apparatus according to Claim 1, wherein a switching voltage is clamped with the aid of a diode and a winding in order to prevent that an extraordinary over voltage is applied to the switching means.
7. An isolated type switching power supply apparatus according to Claim 1, wherein FA5500 or its compatible control IC is used and a demodulating signal is supplied into a multiplier input of said IC.
8. An isolated type switching power supply apparatus according to Claim 1, wherein FA5500 or its compatible control IC is used and a voltage corresponding to a VCC voltage is applied on an FB terminal of said IC to realize an over-voltage protection.
- 5 9. An isolated type switching power supply apparatus according to Claim 1, wherein a PFC operation realizing a fly-back converter is provided in the front stage of said apparatus; and wherein the number of turn of the primary and secondary windings of said transformer is arranged to be one to one (1:1); and wherein a capacitor is connected to said transformer so as to make the primary winding and the secondary windings alternatively parallel.
- 10 10. An isolated type switching power supply apparatus which comprises a power supply, a transformer being connected to said power supply, a switching means for switching an electric current going through a primary winding of said transformer with a switching frequency so that an energy generated on the primary side of said transformer is sent to the secondary side in accordance with the operation of said switching means, comprising:

15 a switching means controlling circuit for detecting a magnetic energy
appearing on said transformer from a third winding of the transformer and controlling
an operation of said switching means in accordance with an amount of change of the
thus detected magnetic energy; and

20 a load regulation correcting means for detecting an input electric current of
said apparatus and correcting a load regulation of the apparatus in accordance with the
thus detected input electric current;

wherein the detection of said input electric current in the load regulation
correcting means is conducted by detecting a duty ratio of said switching means.

11. An isolated type switching power supply apparatus according to Claim 10,
25 wherein said apparatus carries out a soft switching operation.

12. An isolated type switching power supply apparatus according to Claim 10,
wherein said apparatus comprises a synchronous means using an EFT at the secondary
side of the transformer.

13. An isolated type switching power supply apparatus according to Claim 10,
wherein said switching means controlling circuit is so arranged as to detect a ZCD
(Zero Current Detect) and then turn the switching means ON after the ZCD is detected
and then a predetermined time period has passed, and wherein a capacitor and a diode
5 are provided for an AC coupling to detect the ZCD.

14. An isolated type switching power supply apparatus according to Claim 10,
wherein a switching voltage is clamped with the aid of a diode and a winding in order
to prevent that an extraordinary over voltage is applied to the switching means.

5 15. An isolated type switching power supply apparatus according to Claim 10,
wherein a PFC operation realizing a fly-back converter is provided in the front stage of
said apparatus; and wherein the number of turn of the primary and secondary windings
of said transformer is arranged to be one to one (1:1); and wherein a capacitor is
connected to said transformer so as to make the primary winding and the secondary
10 windings alternatively parallel.